8121SHZGE

8321SD3V41GE

8121J85ZGE223

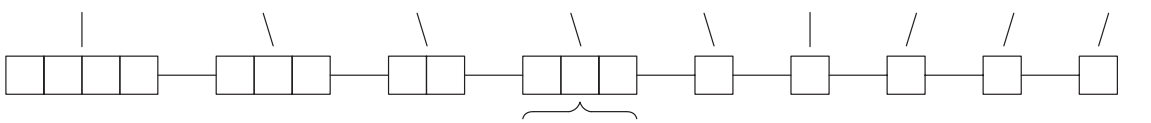
8421SD9AV1GE

® models available, see page C-4.

C

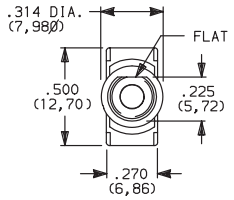
Easy Build-A-Switch

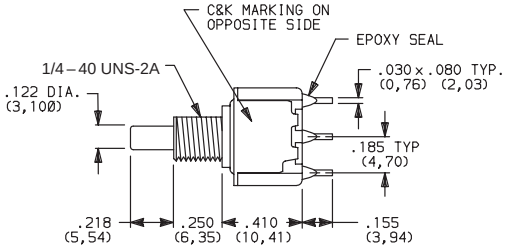
Below is a complete listing of available options for 8020 SERIES SNAP-ACTING MOMENTARY PUSHBUTTON SWITCHES. Build-A-Switch allows you to mix and match options to create the switch you need—simply select desired option from each category. Switches with standard options are shown on page C-3; all available options are shown and described on pages C-4 thru C-17. When building a part number, some ordering format boxes may not be filled. Dashes, hyphens or spaces in the part number are not significant, and are shown for clarity only. Complete HOW TO ORDER information is at the end of this section, page C-17. Actuator caps, frames, hardware and accessories are available separately, see section K. All models have epoxy terminal seal, and are compatible with 'bottom-wash' PC board cleaning methods.

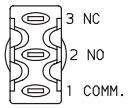


SWITCH FUNCTION	ACTUATOR OR PLUNGER	BUSHING	TERMINATIONS		CONTACT MATERIAL	SEAL	CAP COLOR	FRAME COLOR	LED COLOR
8121	J80	(NONE)	A	V21	B	E	(NONE)	(NONE)	(NONE)
8125	J81	D	A2	V31	G	I	1	1	3
8221	J82	D2	A3	V41	K		2	2	5
8225	J83	D3	A4	V61	L		3	3	6
8321	J84	D8	A6	V71					
8325	J85	D9	AV1	V81					
8421	J95	H	AV2	V91					
8425	L	H9	AV3	W					
U811	M	Y	AV4	W1					
U821	S	Y3	AW	W3					
U831		Y4	AW1	W4					
U841		Y9	AW3	Z					
			AW4	Z3					
			C						
			R						
			R2						
			V2						
			V3						
			V4						
			V6						
			V7						
			V8						
			V9						

SWITCHES WITH STANDARD OPTIONS



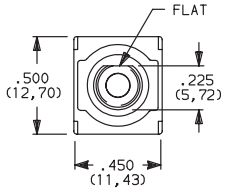


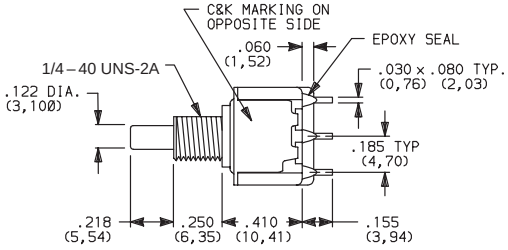


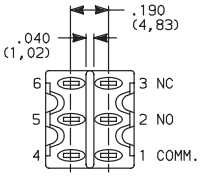
Terminal Nos.
For Reference Only

SPDT Model

Part No. Shown: 8121SHZGE



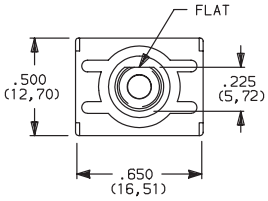


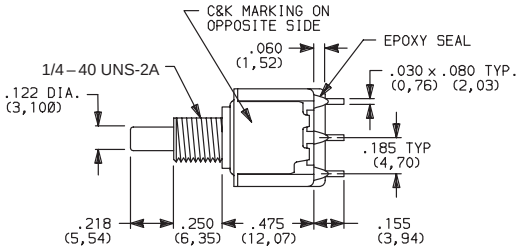


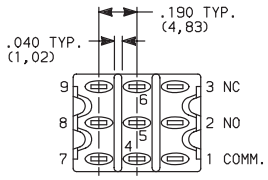
Terminal Nos.
For Reference Only

DPDT Model

Part No. Shown: 8221SHZGE



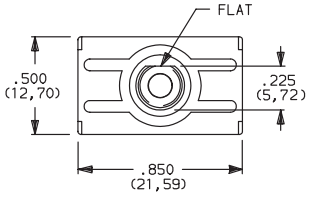


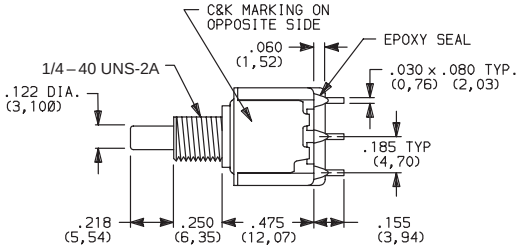


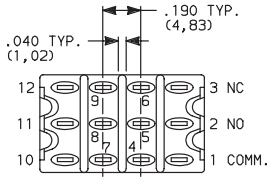
Terminal Nos.
For Reference Only

3PDT Model

Part No. Shown: 8321SHZGE







Terminal Nos.
For Reference Only

4PDT Model

Part No. Shown: 8421SHZGE

SWITCH FUNCTION

NO. POLES	MODEL NO.	UL / CSA* MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	CONNECTED TERMINALS POS. 1	CONNECTED TERMINALS POS. 2	SCHEMATIC
SP	8121	U811	ON	MOM.	1-3	1-2	SPDT
	8125		ON	MOM.			
DP	8221	U821	ON	MOM.	1-3,4-6	1-2,4-5	DPDT
	8225		ON	MOM.			
3P	8321	U831	ON	MOM.	1-3,4-6,7-9	1-2,4-5,7-8	3PDT
	8325		ON	MOM.			
4P	8421	U841	ON	MOM.	1-3,4-6,7-9,10-12	1-2,4-5,7-8,10-11	4PDT
	8425		ON	MOM.			

MOM. = Momentary

* U811 thru U841 model numbers with all options (except R, R2 terminations) when ordered with G or L contact material.

See AGENCY APPROVALS, page VIII.

8X25 models must be ordered with B or K contact material.

8X21 and U8X1 models must be ordered with G or L contact material.

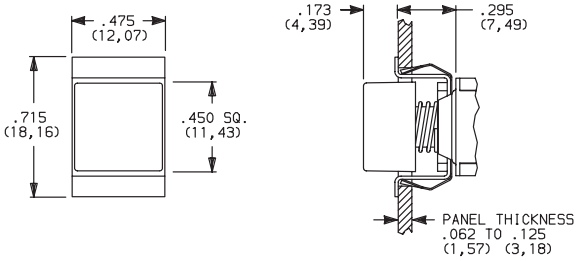
ACTUATOR—SNAP-IN FRONT MOUNT

CAP COLOR

ACTUATOR OR PLUNGER

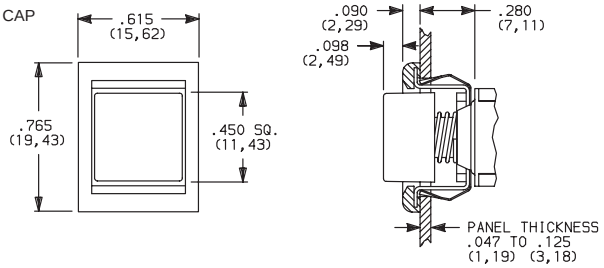
FRAME COLOR

J80

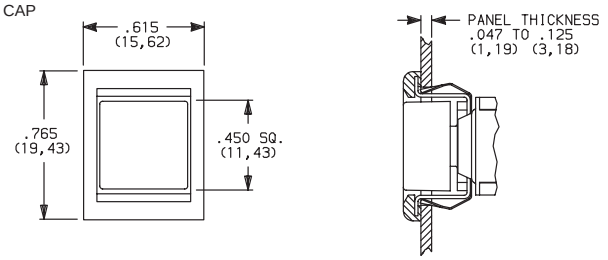


No frame color choice required.

J81 WITH FRAME AND RAISED CAP



J83 WITH FRAME AND FLUSH CAP



CAP AND FRAME COLORS

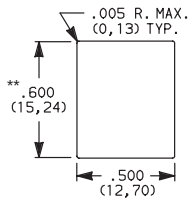
OPTION CODE	COLOR
(NONE)	No Frame Color (J80 option)
1	WHITE
2	BLACK (Std.)
3	RED

Other colors available, consult factory.
Cap and Fame Finish: matte.

NOTE: Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

PANEL MOUNTING

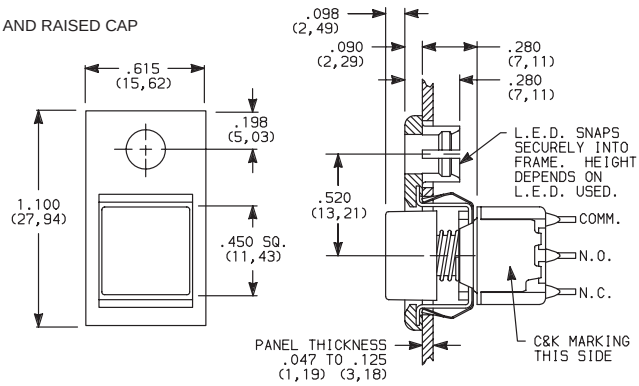
J80, J81 & J83 Actuators



** Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

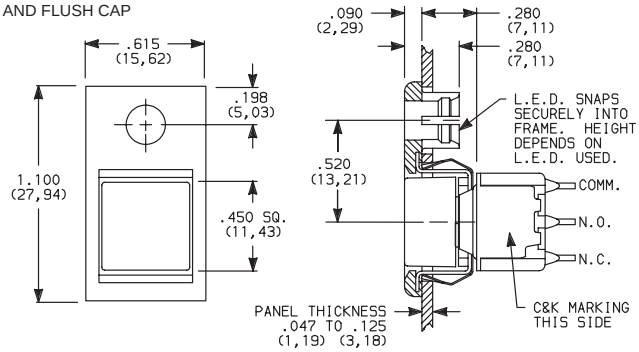
ACTUATOR—SNAP-IN FRONT MOUNT

J82 WITH FRAME FOR LED AND RAISED CAP



LED not included.
See page IX for LED information.

J84 WITH FRAME FOR LED AND FLUSH CAP



LED not included.
See page IX for LED information.

CAP AND FRAME COLORS

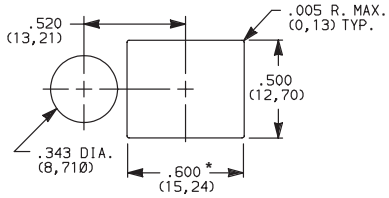
OPTION CODE	COLOR
1	WHITE
2	BLACK (Std.)
3	RED

Other colors available, consult factory.
Cap and frame finish: matte.

NOTE: Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

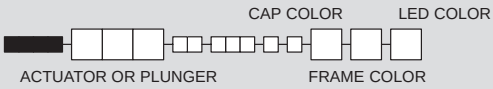
PANEL MOUNTING

J82 & J84 Actuators

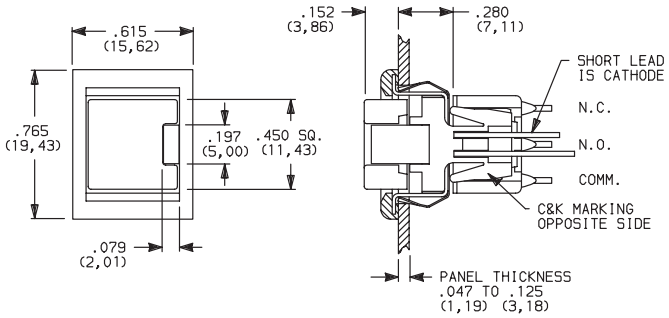


* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

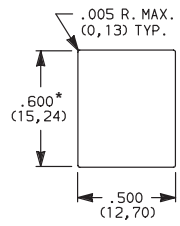
ACTUATOR—SNAP-IN FRONT MOUNT



J85 WITH FRAME, RAISED CAP, AND BUILT-IN LED



PANEL MOUNTING



* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

See page IX for LED information.

CAP AND FRAME COLORS

OPTION CODE	COLOR
1	WHITE
2	BLACK (Std.)
3	RED

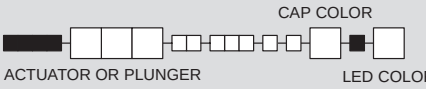
LED COLORS

OPTION CODE	COLOR
3	RED (Std.)
5	YELLOW
6	GREEN

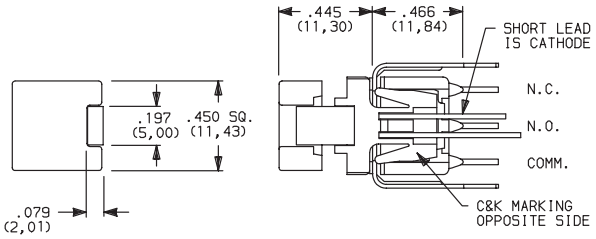
Other colors available, consult factory.
Cap and frame finish: matte.

NOTE: Available with C, W-W4, Z or Z3 terminations and SPDT models only.

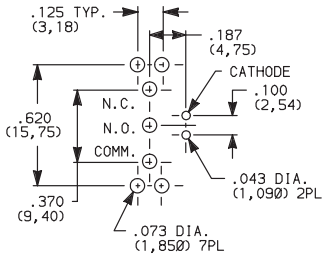
ACTUATOR—PC MOUNT



J95 WITH BUILT-IN LED



PC MOUNTING



See page IX for LED information.

CAP COLORS

OPTION CODE	COLORS
1	WHITE
2	BLACK (Std.)
3	RED

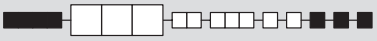
LED COLORS

OPTION CODE	COLORS
3	RED (Std.)
5	YELLOW
6	GREEN

Cap Finish: matte. Other colors available, consult factory.

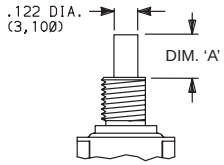
NOTE: Available with V3 terminations and SPDT models only.

PLUNGER

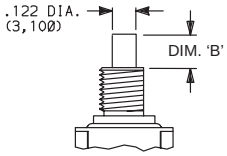


(NONE) NO PLUNGER CHOICE REQUIRED (JXX ACTUATORS)

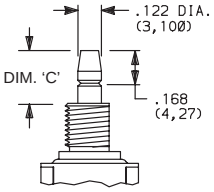
S (STD.)



L



M SNAP-FITTING



AVAILABLE BUSHINGS	DIM. 'A' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'A' FOR A, A2, A3, A4, A6, AV1-AV4, AW-AW4, R & R2 TERMINATIONS	DIM. 'A' FOR V2-V91 TERMINATIONS
D, D9	.244 (6,20)	.228 (5,79)	.224 (5,69)
H, H9	.218 (5,54)	.202 (5,13)	.198 (5,03)
Y, Y9	.203 (5,16)	.187 (4,75)	.183 (4,65)
Y3	(5,54)	(5,13)	(5,03)
Y4	.185 (4,70)	.169 (4,29)	.165 (4,19)
D2, D8	N/A	.232 (5,89)	.228 (5,79)
D3	.178 (4,52)	.162 (4,11)	.158 (4,01)

AVAILABLE BUSHINGS	DIM. 'B' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'B' FOR A, A2, A3, A4, A6, AV1-AV4, AW-AW4, R & R2 TERMINATIONS	DIM. 'B' FOR V2-V91 TERMINATIONS
Y, Y9	.178 (4,52)	.162 (4,11)	.158 (4,01)
Y4	.090 (2,29)	.074 (1,88)	.070 (1,78)

AVAILABLE BUSHINGS	DIM. 'C' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'C' FOR A, A2, A3, A4, A6, AV1-AV4, AW-AW4, R & R2 TERMINATIONS	DIM. 'C' FOR V2-V91 TERMINATIONS
D, D9	.297 (7,54)	.281 (7,14)	.277 (7,04)
H, H9	.267 (6,78)	.251 (6,38)	.247 (6,27)
Y, Y9	.259 (6,58)	.243 (6,17)	.239 (6,07)
Y3	(6,78)	(6,37)	(6,27)
Y4	.259 (6,58)	.243 (6,17)	.239 (6,07)
D2, D8	N/A	.273 (6,93)	.269 (6,83)
D3	.377 (9,58)	.361 (9,17)	.357 (9,07)

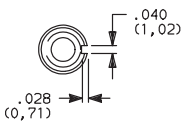
N/A = NOT AVAILABLE

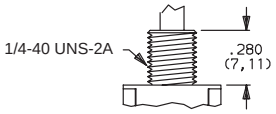
NOTE: When selecting plunger option, bushing selection must also be made, see next page. No plunger option is required when any JXX actuator option is selected. Additional plunger lengths are available on SPDT and DPDT models, consult factory. Not all plunger lengths sufficient for use with caps. See cap dims., section K.

BUSHING

(NONE) NO BUSHING CHOICE REQUIRED (JXX ACTUATORS)

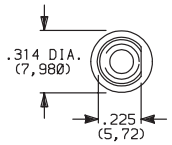
D
D9 UNTHREADED

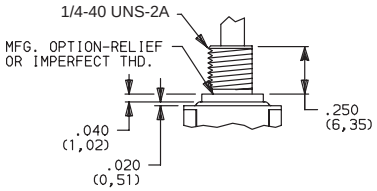




D9 bushing standard with A-A6, AW-AW4, R, R2 AV1-AV4 terminations.

H
H9 UNTHREADED

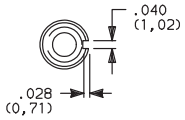


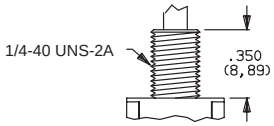


H bushing standard with C, W-W4, Z or Z3 terminations. H, H9 bushings not available on single pole models with A3-A6, AW-AW4, R, R2 terminations.

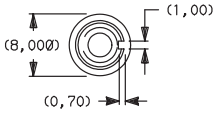
Will withstand 12 in./lbs. of torque with no distortion.

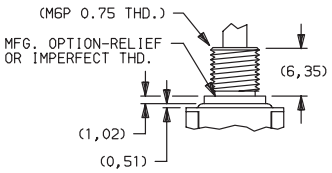
Y
Y9 UNTHREADED



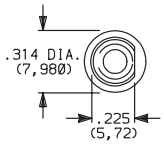


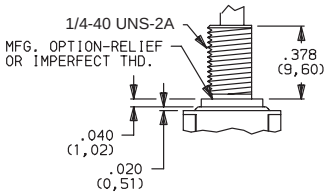
Y3 METRIC





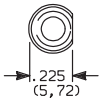
Y4

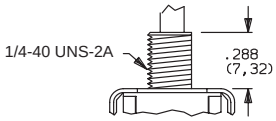




Y3 & Y4 bushings not available on single pole models with A3-A6, AW-AW4, R, R2 terminations. Will withstand 12 in./lbs. of torque with no distortion.

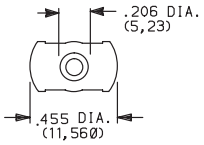
D2
D8 UNTHREADED

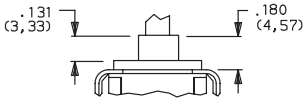




D2, D8 bushings not available with C, W-W4, Z, Z3 terminations.

D3



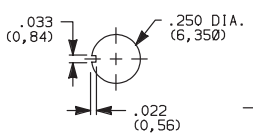


D3 bushing standard with V2-V91 terminations.

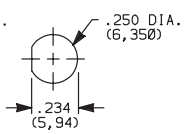
NOTE: No bushing option choice required when JXX actuator option is selected. When selecting bushing option, plunger selection must also be made, see previous page. Plunger lengths vary with bushing and termination options selected.

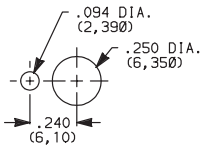
PANEL MOUNTING

1/4 INCH BUSHING

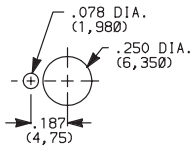


Without locking ring



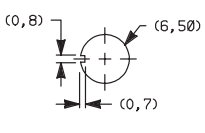


With standard locking ring

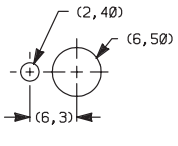


With small locking ring

METRIC BUSHING



Without locking ring



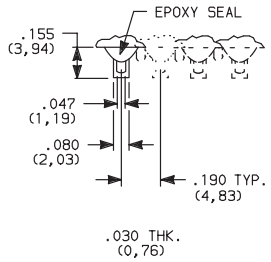
With locking ring

NOTE: Two mounting nuts, locking ring and lockwasher supplied standard with threaded bushings. Optional mounting nut and locking ring styles available, see HARDWARE, section K.

C

TERMINATIONS

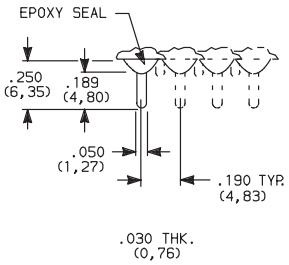
Z (STD.)



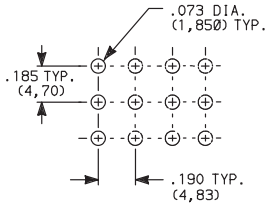
SPDT thru 4PDT Models

NOTE: Not available with J95 actuator, K or L contact material.

C



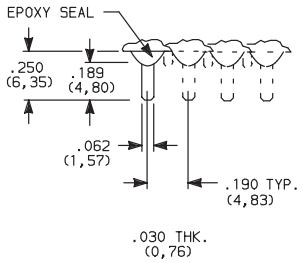
PC MOUNTING



SPDT thru 4PDT Models

NOTE: Not available with J95 actuator option.

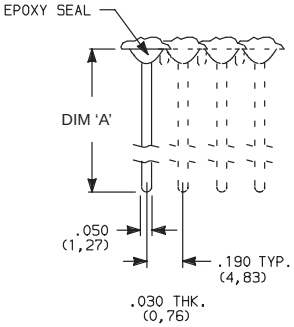
Z3 QUICK CONNECT



NOTE: Not available with J95 actuator, K or L contact material. Mating quick connector available, order part no. 530100000.

SPDT thru 4PDT Models

W, W1, W3, W4 WIRE WRAP

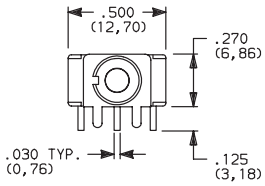


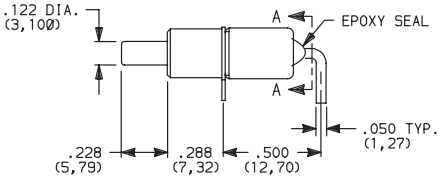
OPTION CODE	DIM 'A'
W	.750 (19,05)
W1	.964 (24,49)
W3	.425 (10,80)
W4	1.062 (26,97)

SPDT thru 4PDT Models

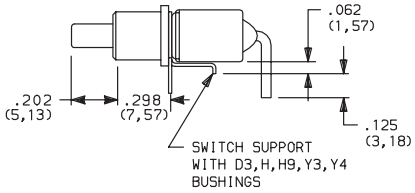
NOTE: Not available with J95 actuator option.

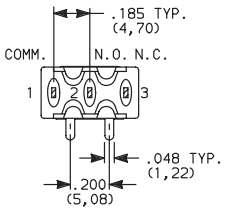
A





Part No. Shown: 8121SD9AGE





SECTION A-A

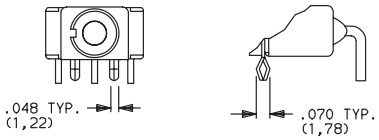
Terminal Nos.
For Reference Only.

SPDT Model

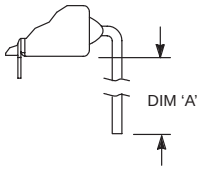
Part No. Shown: 8121SH9AGE

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators and I seal.

A3 SNAP-IN

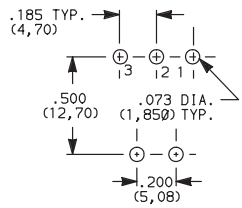


AW, AW1, AW3, AW4 EXTENDED



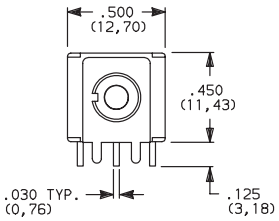
OPTION CODE	DIM 'A'
AW	.50 (12,7)
AW1	.72 (18,3)
AW3	.20 (5,1)
AW4	.83 (21,1)

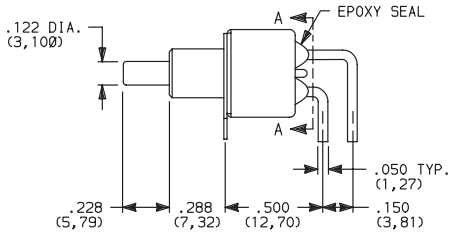
PC MOUNTING

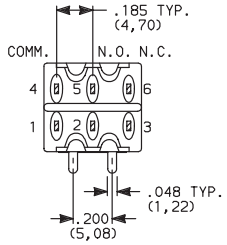


TERMINATIONS

A







SECTION A-A

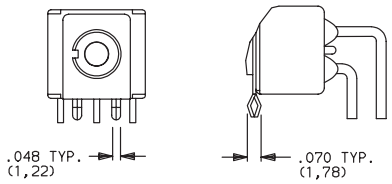
Terminal Nos. For Reference Only

DPDT Model

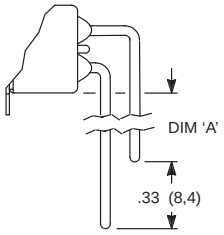
Part No. Shown: 8221SD9AGE

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators and I seal option.

A3 SNAP-IN

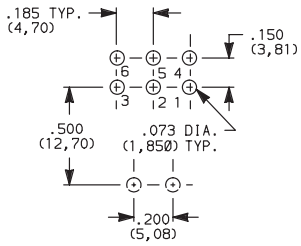


AW, AW1, AW4 EXTENDED

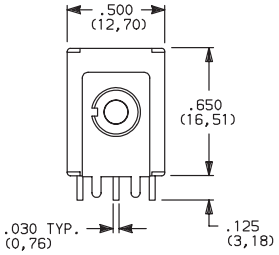


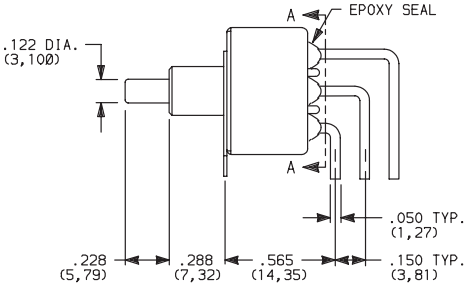
OPTION CODE	DIM 'A'
AW	.19 (4,8)
AW1	.40 (10,2)
AW4	.50 (12,7)

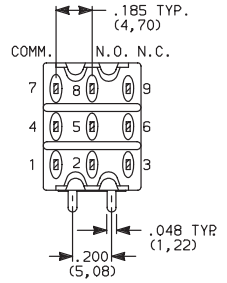
PC MOUNTING



A







SECTION A-A

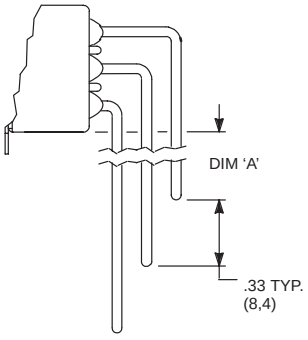
Terminal Nos. For Reference Only

3PDT Model

Part No. Shown: 8321SD9AGE

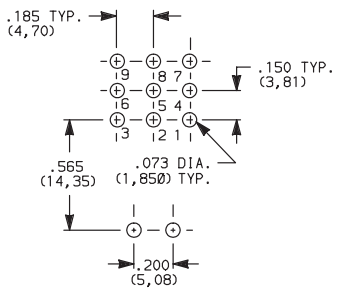
NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators and I seal option.

AW4 EXTENDED



OPTION CODE	DIM 'A'
AW4	.37 (9,4)

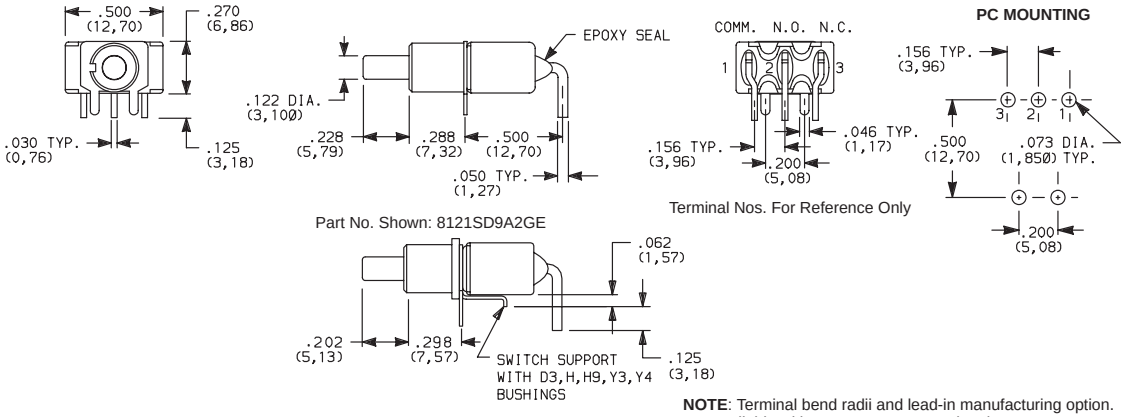
PC MOUNTING



TERMINATIONS

C

A2



Part No. Shown: 8121SD9A2GE

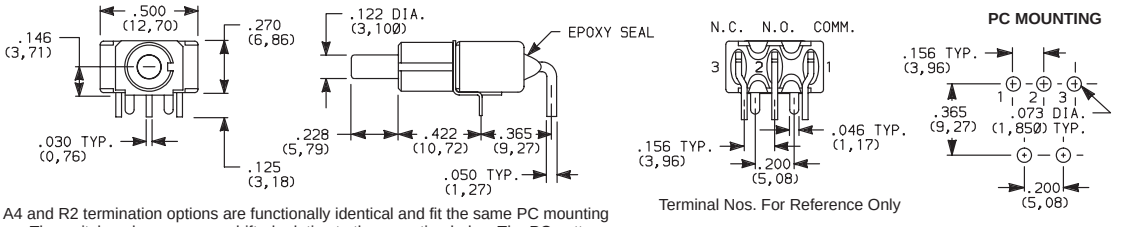
Terminal Nos. For Reference Only

Part No. Shown: 8121SH9A2GE

SPDT Model

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators, I seal option.

A4



The A4 and R2 termination options are functionally identical and fit the same PC mounting pattern. The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R2, the A4 option is available with UL/CSA.

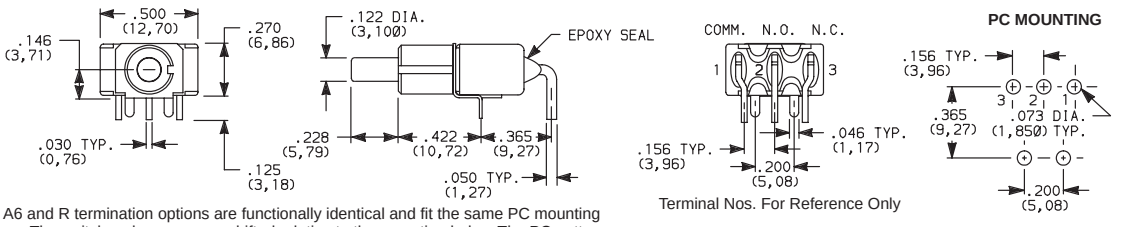
Part No. Shown: 8121SD9A4GE

Terminal Nos. For Reference Only

SPDT Model

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal.

A6



The A6 and R termination options are functionally identical and fit the same PC mounting pattern, The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R, the A6 option is available with UL/CSA.

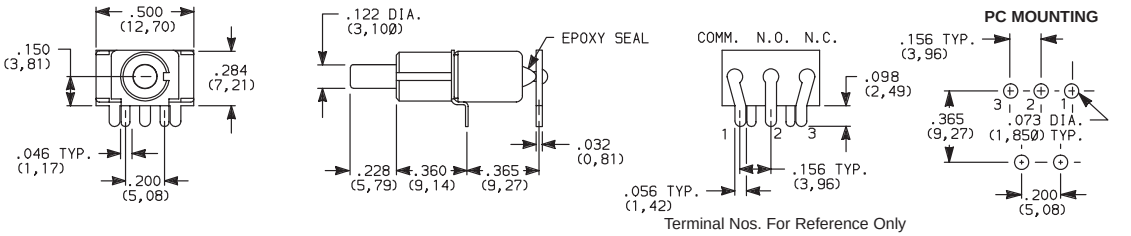
Part No. Shown: 8121SD9A6GE

Terminal Nos. For Reference Only

SPDT Model

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal.

R



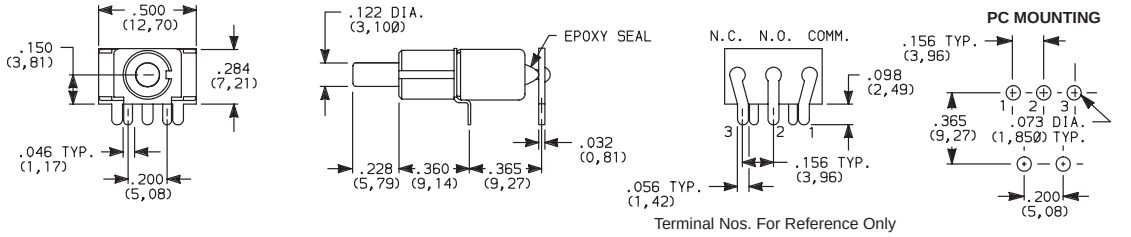
Part No. Shown: 8121SD9RGE

Terminal Nos. For Reference Only

SPDT Model

NOTE: Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option. R termination not UL/CSA approved.

R2



Part No. Shown: 8121SD9R2GE

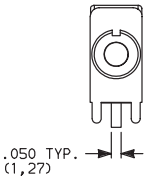
Terminal Nos. For Reference Only

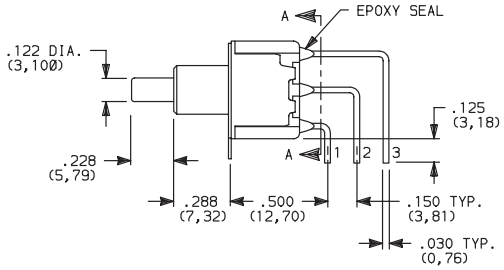
SPDT Model

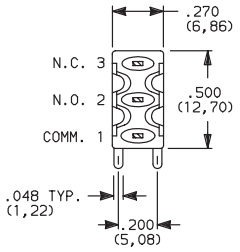
NOTE: Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option. R2 termination not UL/CSA approved.

TERMINATIONS

AV2







SECTION A-A

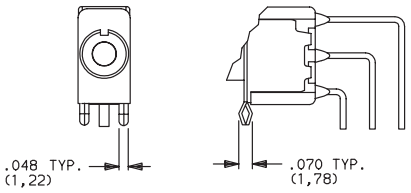
Terminal Nos. For Reference Only

SPDT Model

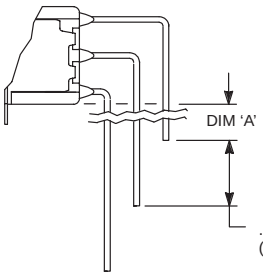
Part No. Shown: 8121SD9AV2GE

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators and I seal.

AV3 SNAP-IN

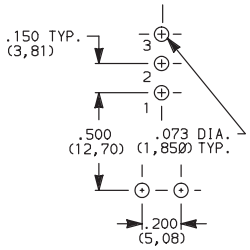


AV1, AV4 EXTENDED

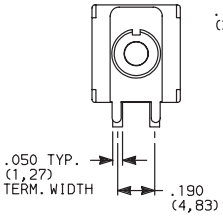


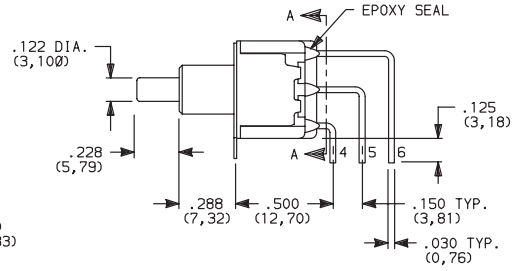
OPTION CODE	DIM 'A'
AV1	.15 (3,8)
AV4	.24 (6,1)

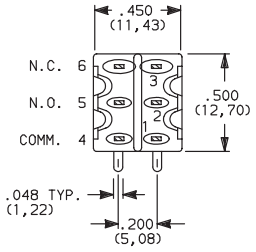
PC MOUNTING



AV2







SECTION A-A

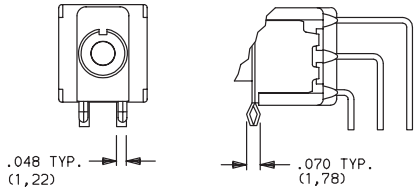
Terminal Nos. For Reference Only

DPDT Model

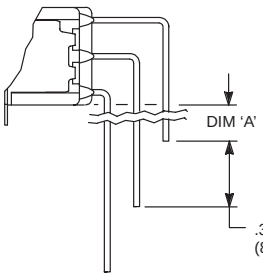
Part No. Shown: 8221SD9AV2GE

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators and I seal.

AV3 SNAP-IN

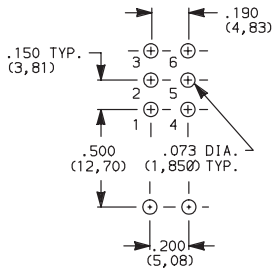


AV1, AV4 EXTENDED



OPTION CODE	DIM 'A'
AV1	.15 (3,8)
AV4	.24 (6,1)

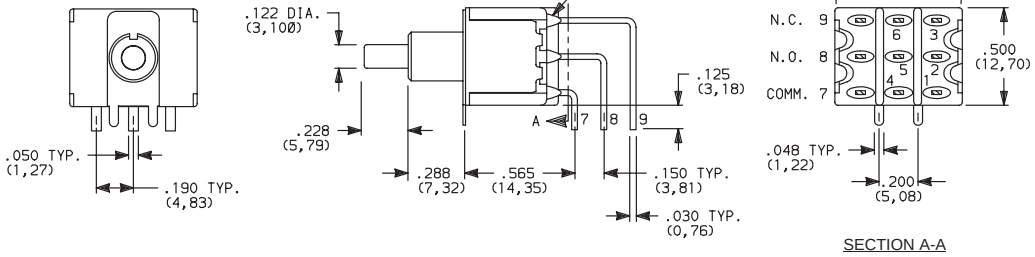
PC MOUNTING



C

TERMINATIONS

AV2



SECTION A-A

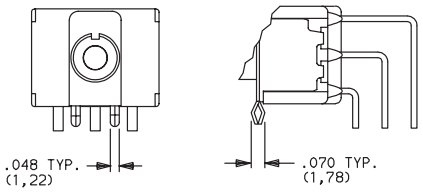
Terminal Nos. For Reference Only

3PDT Model

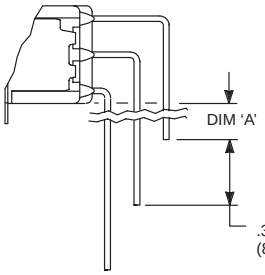
Part No. Shown: 8321SD9AV2GE

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators and I seal.

AV3 SNAP-IN

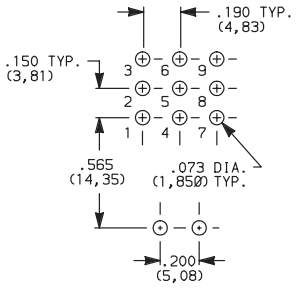


AV1, AV4 EXTENDED

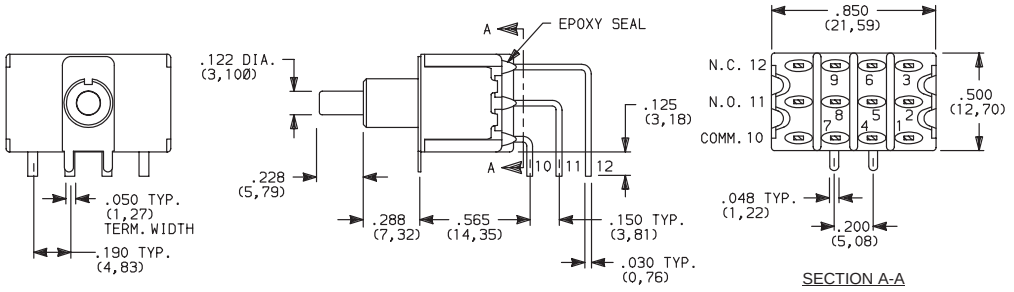


OPTION CODE	DIM 'A'
AV1	.15 (3,8)
AV4	.24 (6,1)

PC MOUNTING



AV2



SECTION A-A

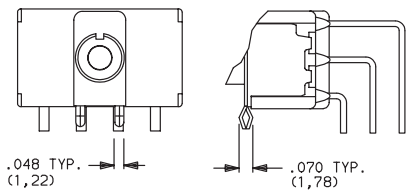
Terminal Nos. For Reference Only

4PDT Model

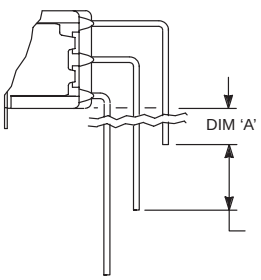
Part No. Shown: 8421SD9AV2GE

NOTE: Terminal bend radii and lead-in manufacturing option. Not available with JXX actuators and I seal.

AV3 SNAP-IN

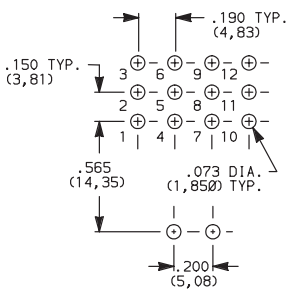


AV1, AV4 EXTENDED



OPTION CODE	DIM 'A'
AV1	.15 (3,8)
AV4	.24 (6,1)

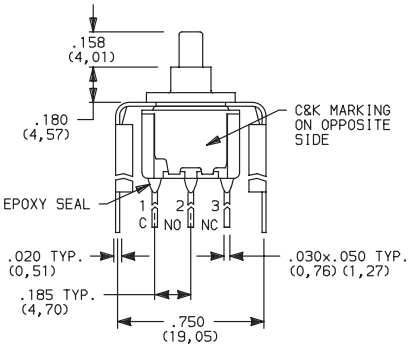
PC MOUNTING

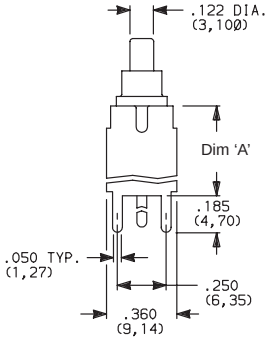


TERMINATIONS

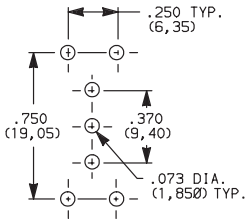
SPDT Model

V2, V6, V7, V8 REPLACES V20, V60, V70, V80





PC MOUNTING

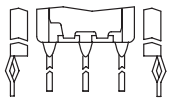


Terminal Nos. For Reference Only.

Part No. Shown: 8121SD3__GE

NOTE: Not available with JXX actuators and I seal.

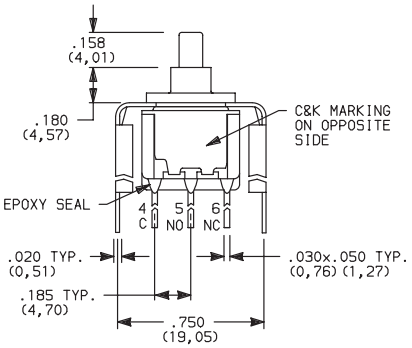
V21, V61, V71, V81 SNAP-IN

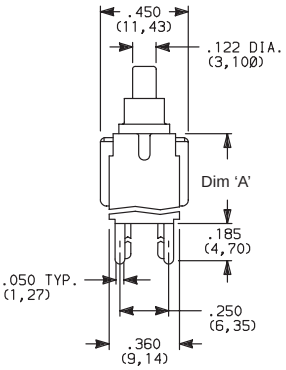


OPTION CODE	DIM 'A'
V2, V21	.555 (14,10)
V6, V61	.460 (11, 68)
V7, V71	.630 (16, 00)
V8, V81	.953 (24, 21)

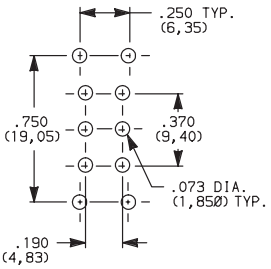
DPDT Model

V2, V6, V7, V8 REPLACES V20, V60, V70, V80





PC MOUNTING

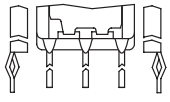


Terminal Nos. For Reference Only.

Part No. Shown: 8221SD3__GE

NOTE: Not available with JXX actuators and I seal.

V21, V61, V71, V81 SNAP-IN



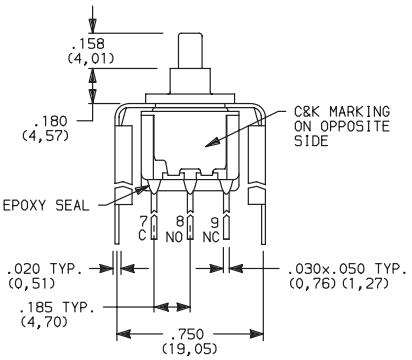
OPTION CODE	DIM 'A'
V2, V21	.555 (14,10)
V6, V61	.460 (11, 68)
V7, V71	.630 (16, 00)
V8, V81	.953 (24, 21)

TERMINATIONS

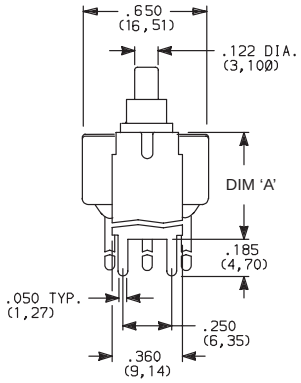
C

3PDT Model

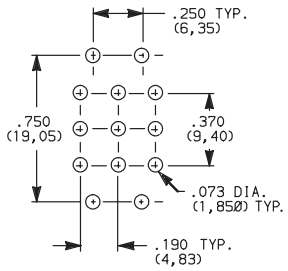
V2, V7, V8 REPLACES V20, V70, V80



Terminal Nos. For Reference Only.



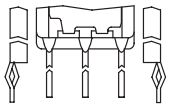
PC MOUNTING

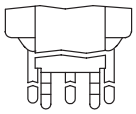


Part No. Shown: 8321SD3__GE

NOTE: Not available with JXX actuators and I seal.

V21, V71, V81 SNAP-IN

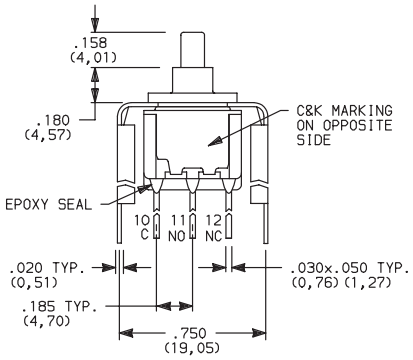




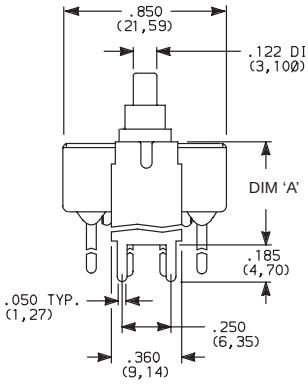
OPTION CODE	DIM 'A'
V2, V21	.555 (14,10)
V7, V71	.630 (16, 00)
V8, V81	.953 (24, 21)

4PDT Model

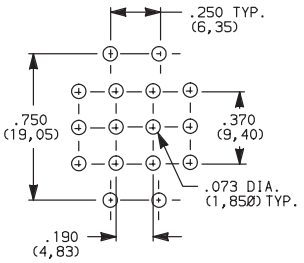
V2, V7, V8 REPLACES V20, V70, V80



Terminal Nos. For Reference Only.



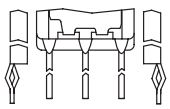
PC MOUNTING

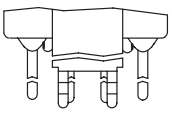


Part No. Shown: 8421SD3__GE

NOTE: Not available with JXX actuators and I seal.

V21, V71, V81 SNAP-IN





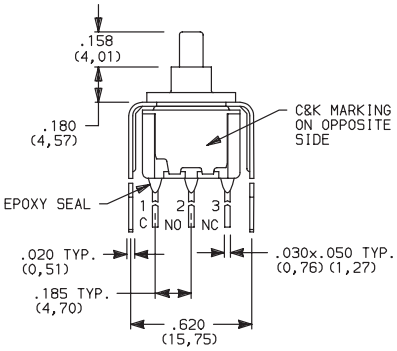
OPTION CODE	DIM 'A'
V2, V21	.555 (14,10)
V7, V71	.630 (16, 00)
V8, V81	.953 (24, 21)

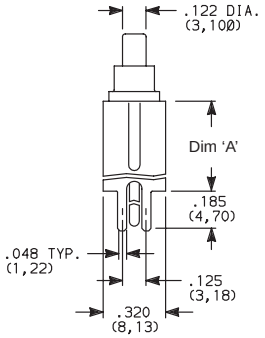
TERMINATIONS

C

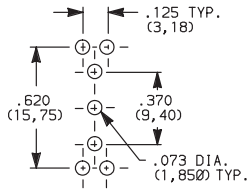
SPDT Model

V3, V4, V9 REPLACES V30, V40, V90





PC MOUNTING

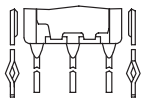


Terminal Nos. For Reference Only.

Part No. Shown: 8121SD3__GE

NOTE: Not available with J8X actuators and I seal.

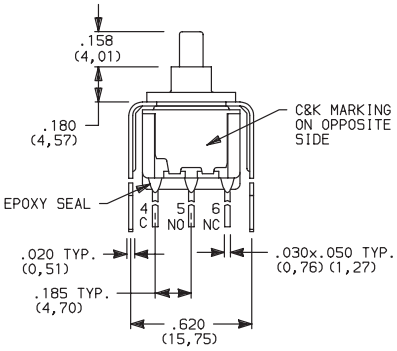
V31, V41, V91 SNAP-IN

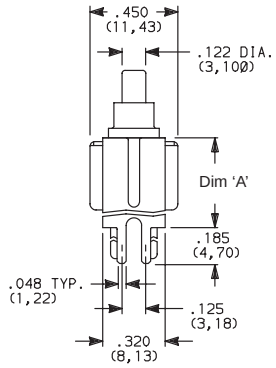


OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)
V9, V91	1.150 (29,21)

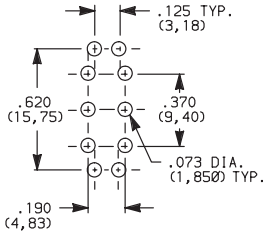
DPDT Model

V3, V4, V9 REPLACES V30, V40, V90





PC MOUNTING

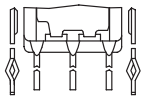


Terminal Nos. For Reference Only.

Part No. Shown: 8221SD3__GE

NOTE: Not available with J8X actuators and I seal.

V31, V41, V91 SNAP-IN



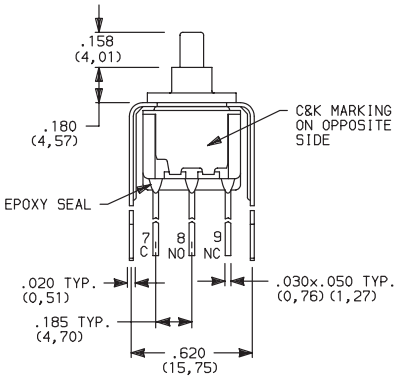
OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)
V9, V91	1.150 (29,21)

TERMINATIONS

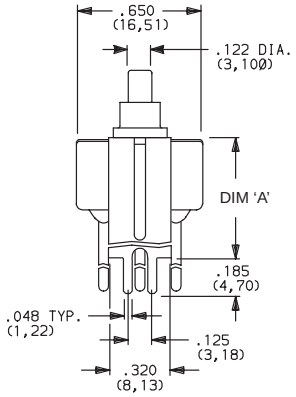
C

3PDT Model

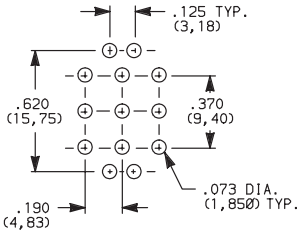
V4, V9 REPLACES V40, V90



Terminal Nos. For Reference Only.



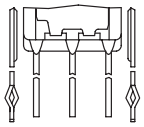
PC MOUNTING

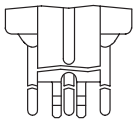


Part No. Shown: 8321SD3__GE

NOTE: Not available with JXX actuators and I seal.

V41, V91 SNAP-IN

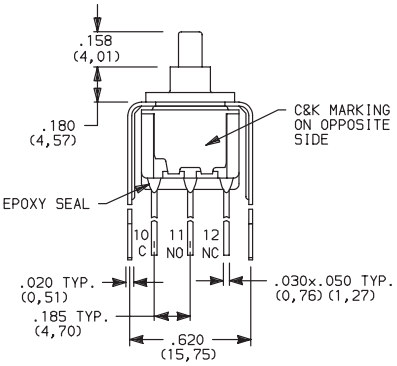




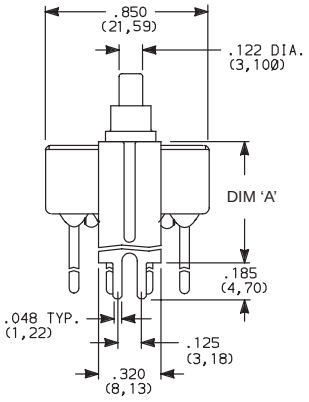
OPTION CODE	DIM 'A'
V4, V41	.630 (16,00)
V9, V91	1.150 (29,21)

4PDT Model

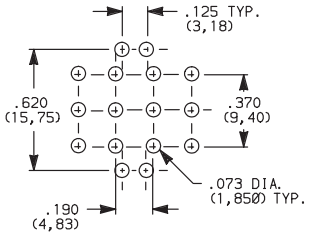
V4, V9 REPLACES V40, V90



Terminal Nos. For Reference Only.



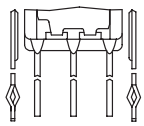
PC MOUNTING

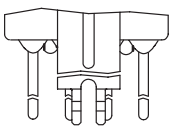


Part No. Shown: 8421SD3__GE

NOTE: Not available with JXX actuators and I seal.

V41, V91 SNAP-IN





OPTION CODE	DIM 'A'
V4, V41	.630 (16,00)
V9, V91	1.150 (29,21)

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL / DRY CIRCUIT	8X25 MODELS ONLY: 0.4 VA MAX. @ 20 V AC OR DC MAX.
K		TIN-LEAD [4]		
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL / DRY CIRCUIT OR POWER	8X21, U8X1 MODELS ONLY: 0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC;
L		TIN-LEAD [4]		

CONTACT MATERIAL / APPLICATION RECOMMENDATIONS – SEE CHART, PAGE X.

[1] ALL CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] N.O. & N.C. CONTACTS: Coin silver, with gold plate over nickel plate.

[3] COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

[4] TERMINALS: Copper alloy, with tin-lead alloy over nickel plate.

U811-U841 models ® with all options (except R, R2 terminations) when ordered with mandatory G or L contact material.

See AGENCY APPROVALS, page VIII.

B or K contact material must be ordered with 8X25 models.

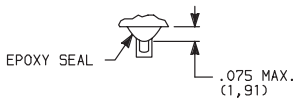
G or L contact material must be ordered with 8X21, U8X1 models.

K and L contact material not available with Z, Z3 terminations.

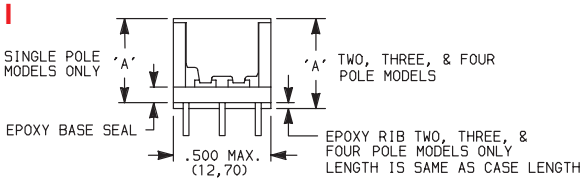
C

SEAL

E (STD.)



I



NO. POLES	DIM 'A'
SP	.410 (10,41)
DP	.440 (11,18)
3P	.505 (12,83)
4P	.505 (12,83)

NOTE: Available with C, W-W4, Z, Z3 terminations only.

HOW TO ORDER

All available 8020 SERIES SNAP-ACTING MOMENTARY PUSHBUTTON SWITCH options are listed on page C-2 and are described on pages C-4 thru C-17. Switches with standard options are shown on page C-3. When selecting options and building a part number, some ordering format boxes may not be filled. Dashes, hyphens or spaces in the part number are not significant, and are shown for clarity only. All models have epoxy terminal seal and are compatible with 'bottom wash PC board cleaning methods. Actuator caps, frames, hardware and accessories are available separately, see section K. Custom actuator markings and legends available, consult factory.

SPECIFICATIONS

CONTACT RATING:
8X21, U8X1 MODELS: 1 AMP @ 120 V AC or 28 V DC or 0.4 VA max. @ 20 V AC or DC max. (G contact material).
8X25 MODELS: 0.4 VA max. @ 20 V AC or DC maximum (B contact material).
NOTE: Break-before-make contacts. Multi-pole contact do not make and break simultaneously.

ELECTRICAL LIFE: 60,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 50 milliohms typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10^9 ohms min.

DIELECTRIC STRENGTH: 1,000 V RMS min. @ sea level.

OPERATING TEMPERATURE: 8X2X MODELS: –30°C to 75°C.
U8X1 MODELS: –30°C to 65°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

MATERIALS

CASE: Glass filled nylon 6/6, flame retardant, heat stabilized or diallyl phthalate (DAP) (UL 94V-0).

PLUNGER: Glass filled nylon or glass filled polyester (UL 94V-0).

CAP & FRAME: Nylon, black, standard.

BUSHING: Brass or zinc, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass or steel, tin plated.

N.O. & N.C. CONTACTS
8X21, U8X1 MODELS: Coin silver, with gold plate over nickel plate (G contact material).
8X25 MODELS: Copper alloy, with gold plate over nickel plate (B contact material).

COMMON CONTACT & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

TERMINAL SEAL: Epoxy.

HARDWARE: Nut & Locking Ring: Brass, nickel plated; Lockwasher: Steel, nickel plated.

NOTE: Specifications and materials listed above are general specifications for switches with standard options. For information on specific and custom switches, consult factory.